

## Duchamp's Eroticism: A Mathematical Analysis

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# Duchamp's Eroticism: A Mathematical Analysis

Craig Adcock

Eroticism was fundamental to Marcel Duchamp's artistic production. His use of sexual innuendos, including those of the bizarre mechanical workings of his masterpiece, *The Bride Stripped Bare by Her Bachelors, Even*, are at least part of the reason for the notoriety of his works and their impact on twentieth-century art. The eroticism of his paintings and sculptures made them interesting. Through their sexual iconography, he could shock his audience into paying attention and then allow the *double-entendres* to carry an important part of his meaning. Duchamp said that everyone understands eroticism, but no one talks about it, and that through eroticism one can approach important issues that usually remain hidden.<sup>1</sup>

One of Duchamp's most famous artistic stratagems involving sexuality was his adoption of the character of Rose Sélavy in 1920 or 1921. In this early performance work, he dressed as a woman and was photographed so attired by his friend Man Ray (Fig. 1). The resulting images were retouched, Duchamp's fingers made to look more slender, etc., in order to enhance his feminine "look." As a portrait, the photograph has its amusing Dada overtones, but beyond the rakish humor, it has, I believe, some interesting geometrical implications. During the late teens, at the time when Duchamp decided to dress up as a woman, he was becoming increasingly interested in speculative mathematics, particularly  $n$ -dimensional geometry and the fourth dimension. He was then actively working on the geometrical notes for the *Large Glass*, later included in the *Green Box* and *A l'Infinifit*. A central aspect of his involvement with geometry had to do with the results of rotating something through a higher dimensional realm: if a three-dimensional object takes a *demi-tour* through the fourth dimension, it returns mirror-reversed and turned inside out. It seems possible that Duchamp's assumption of a female personality was connected with his notions of the fourth dimension.

Duchamp's source for the notion of taking a *demi-tour* through the fourth dimension was the work of the mathematician Esprit Pascal Jouffret.<sup>2</sup> He discusses what happens when objects are so rotated and at one point footnotes a short work by H. G. Wells entitled "The Plattner Story."<sup>3</sup> In Wells's science fiction, Mr. Plattner is accidentally translated into the fourth dimension and returns with his handedness reversed, his heart on the wrong side of his chest, etc. In short, Mr. Plattner returns from his trip through the fourth dimension as a mirror image of his former self.<sup>4</sup> It is possible that Du-



Fig. 1 Man Ray, Marcel Duchamp as Rose Sélavy, 1920–21. Philadelphia Museum of Art. The Samuel S. White and Vera White collection.

champ was thinking along these lines when he chose a female alter ego. By becoming Rose Sélavy, the artist undergoes an even more dramatic change than Mr. Plattner, becoming radically transposed and inverted.

How this particular transsexual geometry would work is suggested by a diagram from Jouffret's *Traité élémentaire de géométrie à quatre dimensions* (Fig. 2). Referring to this illustration, the mathematician explains that "two symmetrical tetrahedrons, which it is impossible to superpose in three-dimensional space, just as it is impossible to put on one hand the glove from the other hand," can be superposed if rotated through the fourth dimension. He begins by showing that two obtuse triangles,  $abc$  and  $a'b'c'$ , cannot be placed directly on top of one another if they are only rotated within the plane they are drawn on, that is, if they are only moved about on their surface world. But if one of the triangles is rotated *through space* around the axis  $AC$  then it is quite easy to superpose the two triangles. Jouffret extends his arguments to the two tetrahedrons  $abcS$  and  $a'b'c'S'$ . These solids could not be superposed by any sort of rotation within three-dimensional space, even if they could freely interpenetrate. But if one of the tetrahedrons is rotated *through the fourth dimension* around the fixed plane  $aSc$ —a plane that would

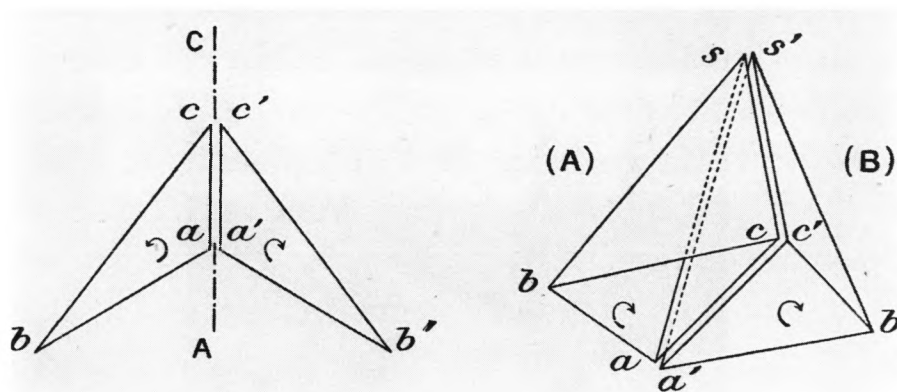


Fig. 2 Illustrations from E. Jouffret, *Traité élémentaire de géométrie à quatre dimensions* (Paris: Gauthier-Villars, 1903), p. 40.

act like the linear axis  $AC$  between the triangles – then the two tetrahedrons can be superposed. In the process, one would be turned inside out and mirror-reversed. A rotation involving symmetrically placed left- and right-hand gloves, as Jouffret also explains, would result in one of the gloves being turned inside out, the left becoming the right, or vice versa.<sup>5</sup> In similar terms, he explains that when a sphere is rotated through the fourth dimension it too is turned inside out: if the inside of the sphere is painted one color and the outside another, these colors are reversed by the rotation.<sup>6</sup>

The geometrical implications of Duchamp's transformation into Rose Sélavy begin to make sense when the sexual changes are considered in relation to the other objects he produced during this same period. Among the important works contemporary with *Rose Sélavy* are *L.H.O.O.Q.* (Fig. 3) and *Fountain* (Fig. 1, p. 65). Both of these can be interpreted in ways that are consistent with his interests in the transformational nature of four-dimensional rotations. The mathematics is serious: it gives Duchamp a way of underlying his surface changes, his humorous Dada superficiality, with deeper significance; it allows him to extend the dimensions of his Dada insight into the philosophical realms of art and aesthetics.

The *Fountain* can be taken as both a shocking object and a geometrical object, and it seems clear that Duchamp wanted to embroil the readymade urinal in a Dada scandal while simultaneously using it as a mathematical metaphor that would necessitate the reconsideration of certain aesthetic assumptions. Among other things, it challenged the importance of originality and the role of personal involvement in artistic production. In purely formal terms, the *Fountain* is an elegant geometrical object; it is symmetrical, smoothly curved, and suggests such mathematical constructs as Klein bottles. Moreover, it is in many ways an archetypal emblem of modernity and mechanical perfection. These aesthetic qualities, of course, in no way diminish the contentious nature of submitting an appropriated men's-room fixture to an unjuried art exhibition.<sup>7</sup> Duchamp wanted to shock people, in-

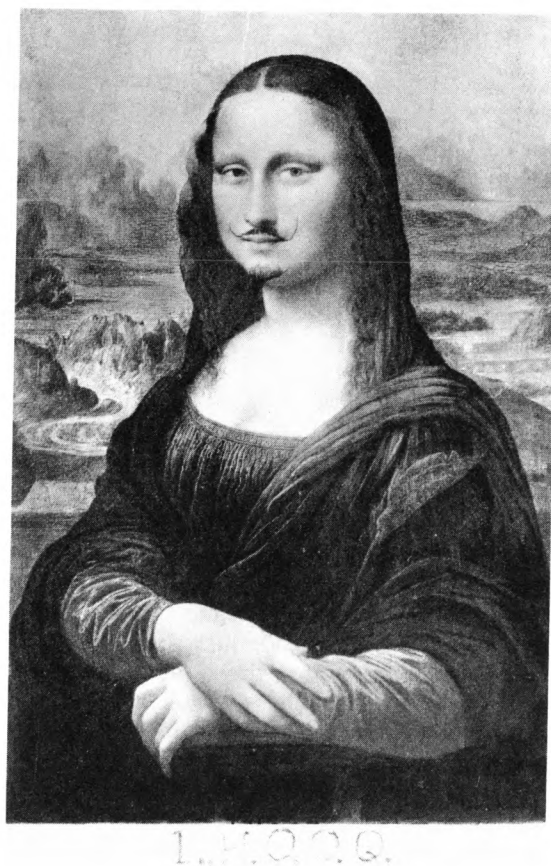


Fig. 3 Marcel Duchamp, *L.H.O.O.Q.*, 1919. Private collection, Paris.

cluding his supposedly avant-garde American associates, and his choice of the urinal was clearly implicated in the generally disputatious position he took in regard to matters of art.

In addition to being both geometrically likable and aesthetically unlikable, the *Fountain* is one of the earliest instances of Duchamp contradicting himself in relation to his own stated principles. The urinal is not an indifferent object, and we should recall that his avowed method of choice involved a system of aesthetic indifference: the readymades were supposed to have been chosen because he neither liked them nor disliked them. Thus, the choice of the urinal, one of the first readymades, contravenes his own stated criteria for selecting found objects. Far from being embarrassed by his self-contradiction, Duchamp uses the difficulty of maintaining a consistent position to further substantiate his opinions about the arbitrariness involved in making an aesthetic choice in the first place. He turns his own principle back

upon himself and his own system. It was a rule that contained its own denial. Duchamp's procedures for choosing readymades – and their collapse – become self-reinforcing methods for being contrary. As Duchamp uses it, the urinal is both an art object and a non-art object, both ugly and beautiful. He argues that few people could like a urinal, but then likes it because of its very loathsomeness. The object's inescapable insolence was directly to his point. He replaces "aesthetic delectation" with "geometrical delectation" and reinforces his beliefs about the provisional nature of making an aesthetic choice by using the urinal to refer subtly to the conventional nature of choosing any given geometry over any other. In other words, viewers can look at the *Fountain* as being either Euclidean or non-Euclidean, just as they can look at it as being either art or non-art.<sup>8</sup>

When the *Fountain* is dissociated from the implications of its useful function – which is not easily done – its geometrical qualities become quite apparent. The purely isometric aspects of the fixture suggest meanings that supersede its traduction of normal artistic practice. A central part of the *Fountain's* geometry is its inversion – a rotation that changes it from a drain into a fountain. Moreover, its 90° rotation can be taken as a reference to the flip-flops involved in four-dimensional rotation. As we have seen, such a rotation through the fourth dimension results in a left-right reversal and an inside-outside transformation. If an object such as the *Fountain* were so rotated, it would undergo, at least in metaphorical terms, a concavity-convexity transposition. Duchamp's enigmatic statement in the *Box of 1914* that "one only has *female* for the pissotière and one *lives* by it"<sup>9</sup> probably alludes to the "femaleness" of concave shapes in the sense that one speaks of connections in machinery as being either "male" or "female." That one must live with this fact about urinals may refer to the impossibility of carrying out four-dimensional rotations in normal three-space. In other words, the *Fountain* can only be rotated ninety degrees; it cannot take a full *demi-tour* through the fourth dimension and thereby have its "female" concavity transformed into "male" convexity.

In even more metaphorical terms, the placement of the *Fountain* can be taken as a reference to the aesthetic transformations involved in Duchamp's general strategy of using readymades. His chosen objects came out of their rotation – out of their revolution – through the art world transformed and reversed. They began as useful objects that could be bought in hardware stores and ended up as useless art objects commanding the same kinds of prices asked for the traditional sculptures found in museums and galleries. During this process, the readymades reversed themselves and confounded our ability either to accept them or deny them. On the one hand, useful objects became useless as works of art, and, on the other hand, the readymades could not really become works of art because they were still potentially useful. Of course, Duchamp himself neither claimed the readymades were works of art nor admitted they were not. They were simply readymades – objects that occupied an area outside either category.<sup>10</sup> In a sense, they operated in a different dimension where the conventional polarities were no longer valid.

Duchamp's system of choosing readymades and then watching them become works of art requires the viewer's acquiescence, and the viewer's own

choices are therefore implicated in the process. Such acts are unavoidable. For Duchamp, the epistemological problem involves what he called the "art coefficient" – the "you and me" or the "tu et me" of the artist/audience interchange. It was this notion of mediation between the artist and his audience that formed one of the central aspects of Duchamp's entire *oeuvre*, and it brings to mind one of his most important paintings, *Tu m'*. This complex work uses the French pronouns for "you" and "me" as its title, and in it, there are a "you" and a "me," but no mediating verb – a fact that suggests the indeterminate nature of the artist's ability to get a message across to the audience that looks at his work.

*Tu m'* has as its subject matter the geometric transformation of readymades: three-dimensional objects become two-dimensional shadows stretched out across the surface of the canvas. In addition to this simple kind of transformation – a basic form of projective geometry – Duchamp was also concerned with more complex categories of *n*-dimensional operation that result in left-right reversals and interdimensional inversions. The fact that the title of *Tu m'* was a left-right reversal of the name he had used to sign the *Fountain* in the previous year surely did not escape him, especially since he continued to be interested in such mirror-reversed names for the next few years and associated them with the fourth dimension. In one of his posthumously published *Notes*, he shows a sketch for the design of the mirror-reversed title of his film *Anémic/Cinéma* – a design later used for the title frame (Fig. 4). The two reversed words meet in what appears to be a corner



Fig. 4 Marcel Duchamp, Title frame from *Anémic Cinéma*, 1926 (filmed with the collaboration of Man Ray). The Museum of Modern Art, New York. Film Stills Archive.

where two mirrors intersect at right angles. Written at the top of the note is the following: "The cutting edge of a blade and transparency and X-rays and the fourth dimension."<sup>11</sup> The sketch is thus associated with the fourth dimension and other aspects of Duchamp's quasi-mathematical category of "infra-thin."<sup>12</sup> The mirror reflection of the film title results in a palindrome



Fig. 5 Photograph of Marcel Duchamp taken with a hinged mirror, 1917.

(almost) and can be compared with the Mutt/Tu m' reversal just mentioned.

In 1917, the year he chose the *Fountain* and just before he began work on *Tu m'*, Duchamp had a trick photograph of himself made using two mirrors hinged together (Fig. 5). This arrangement is similar to the mirror corner suggested in the *Anémic/Cinéma* title frame.<sup>13</sup> In the photograph, the effect of the mirrors meeting at an angle and the resulting reiteration of Duchamp's image makes it seem as if he is being translated around an axis of rotation. It suggests the complexity, the multi-directionality, and outward expansion of the four-dimensional continuum away from normal space.<sup>14</sup> Perhaps more important than the spatial metaphors evident in the photograph are the visual metaphors: the angle of incidence of the perpendicular mirrors multiplies Duchamp's image, giving him a multiple point of view, or a "view of the whole," something he posited would be necessary to "see" four-dimensional objects. Note, however, that he is not looking at any such object, but rather at an "infra-thin" axis of rotation. Simultaneously, the multiple reflections seem to translate him, in geometrical terms, outward along a complex set of axes. Again, the divergence of his image within its mirror world can be understood as a metaphor for the far more intricate and multifarious involvements of the fourth dimension.

Despite the many conceptual difficulties, these were precisely the kinds of speculations Duchamp was concerned with in the notes he was writing for the *Large Glass* during the late teens and early twenties. Because he was interested in such mathematical operations and was using film and photography to deal with them in symbolic terms, it seems reasonable to suppose that he was also concerned with what would happen to his own person if he were rotated through the fourth dimension. Would he be reversed in the manner of Mr. Plattner in the H. G. Wells story? Would he be turned inside out in the manner of Jouffret's tetrahedron or sphere? Or would he undergo



the male/female transpositions implied by his adoption of the character of Rose Sélavy?

Duchamp's intentions can perhaps be clarified by discussing other aspects of Rose Sélavy and the works associated with her. By becoming Rose, the artist changes his identity; he changes his name. The gesture can be seen as an example of what Duchamp called "pictorial nominalism."<sup>15</sup> He believed that naming something transforms it. Calling a manufactured object a ready-made turns an ordinary thing into something uncomfortably like art; adopting a female name and character changes Duchamp himself into a woman. Thus, it seems, Rose Sélavy is at least part ready-made (maid). She, like the *Fountain*, functions according to the rules of Duchamp's "name-ism."<sup>16</sup> He later explained that his decision to use the female name "Rose" was prompted in part by his amusement with the name "Lloyd."<sup>17</sup> The double letters in both set up a kind of echo, an iterative "elementary parallelism" that begins to suggest their reverberation into other dimensions.

In geometry, a "rose" is a figure that expands outward from a center. A "rose" is, of course, also a flower and a woman's name. The notion of "blossoming"—the French word is *épanouissement*—figures prominently in the iconography of the *Large Glass*. It implies not only outward expansion, but also sexual awakening. In his notes, Duchamp refers to the amorphous, cloud-like form in the upper panel as an "*épanouissement cinématique*." This "kinematic blossoming" operates on several levels: it suggests flowering, going through puberty, and expanding into the fourth dimension.<sup>18</sup> The word *épanouissement* is generally translated as "blossoming," but it can also be translated as "expansion." When a flower blooms, it opens and expands outward from a center, much as Duchamp seems to flower and expand outward, multiplied around a common center of rotation in the trick photograph. Like a highly complex blossom, the four-dimensional continuum opens and expands outward from normal three-dimensional space along axes not contained within three-dimensional space. It is in just this sense that Jouffret uses the word *épanouissement*: in one of his discussions of a particularly complex four-dimensional figure, he explains that a "trihedron of the second type" is a figure consisting of three half-planes "issuing from the same line but not situated in the same space." This strange figure is "only the beginning of an expansion [*épanouissement*] into fields of superior degree that become more and more intricate."<sup>19</sup> The *épanouissement cinématique* in the upper panel of the *Large Glass* can stand for the Bride's four-dimensional characteristics. She expands outward from a center into realms that are ninety degrees away from any direction that exists in normal space. It is a cloud-like concept. Indeed, in this kind of speculative domain, a four-dimensional *épanouissement* might also involve the fundamental sexual changes that Duchamp approaches metaphorically by adopting the character of Rose Sélavy. In his calculations, "Rose" equals "Eros."

Duchamp tends to conflate human and non-human categories. He mixes geometrical and human attributes in his readymades and ready-made gestures just as he transposes human sexuality into the mechanical workings of the *Large Glass*. His purposes are in part humorous and in part philosophical. In the words of Octavio Paz, "the *Large Glass* is the painting of a recrea-

tive physics and of a metaphysics poised, like the Hanged Female [the Bride], between eroticism and irony."<sup>20</sup> Duchamp combines affective and geometrical eroticism and irony in ways that disclose the fallibilistic nature of either approach to discourse: the artist seems to feel that talking emotionally (non-scientifically) or geometrically (scientifically) are both provisional and open to question.

Duchamp's method can be examined further by looking at another work closely associated with Rose Sélavy, the readymade aided *Why Not Sneeze?* This small birdcage filled with marble cubes is signed by Rose herself. The title at first seems nonsensical, and, in part, it probably is, but it also sets up a pattern of associations. A sneeze is physiologically similar to an orgasm, or so commonplace wisdom would have it. A sneeze thus resonates on a connotative level commensurate with one of the meanings of the term *épanouissement*. The cage with its randomly dispersed geometrical units also suggests a number of mathematical meanings. The cubes are arranged in a way that recalls the diverse orientations of the fourth dimension. They recall both the



Fig. 6 Marcel Duchamp, Poster for the Third French Chess Championship, Nice, September 2-11, 1925. The Museum of Modern Art, New York. Purchase Fund.

diagrams in Jouffret's books and the chess poster Duchamp designed for the 1925 French chess championship at Nice (Fig. 6). The poster depicts the squares of a chessboard expanded into three-dimensional cubes, perhaps after having undergone some kind of four-dimensional *épanouissement*. This interpretation takes on force when we recall that the French word for a square on a chessboard is *case* and that the word also has a specialized mathematical meaning. In geometry, *case* means "cube" or "cellule" and is often used in just this sense by both Duchamp and Jouffret.<sup>21</sup> Jouffret repeatedly sets up geometric systems in which *cases* are projected from various four-dimensional figures onto three-dimensional figures that can in turn be represented by two-dimensional diagrams. One of these "diverse projections" (Fig. 7) represents an aspect of the four-dimensional tesseract, or, as Jouffret calls it, the octahedroid. The diagram has randomly clumped *cases* that are conceptually similar to Duchamp's poster for the chess tournament and to the marble cubes in *Why Not Sneeze?* In Jouffret's diagram, the *cases* are diversely oriented in relation to the axes of the fourth dimension. The complex arrangement of this speculative hyperspace is suggested by the coordinates at the bottom of the drawing. The dotted line is meant to represent an extra axis or a fourth coordinate perpendicular to each of the normal directions of three-space. Like this strange coordinate system, Duchamp's four-dimensional world folds back upon itself in infinitely complex ways.

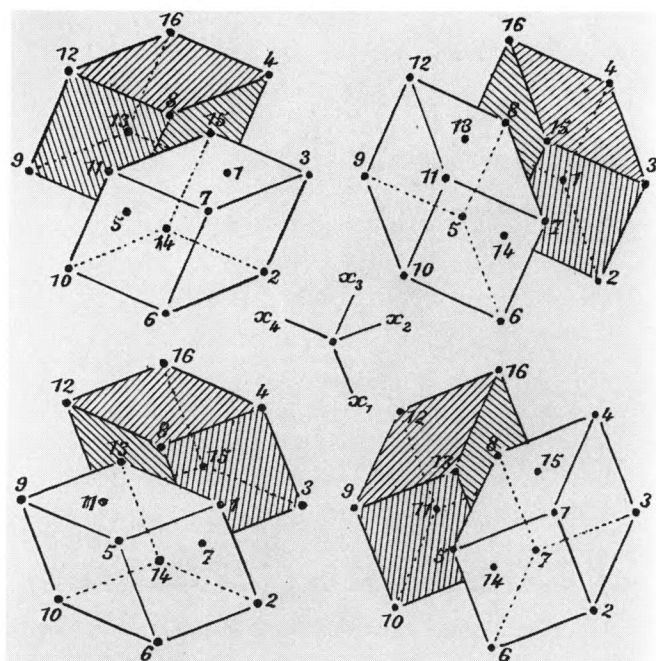


Fig. 7 "Les huit cases hexaédrales qui limitent l'octaédroïde." From E. Jouffret, *Traité élémentaire de géométrie à quatre dimensions* (Paris: Gauthier-Villars, 1903), p. 120.

Rotation is a way of transforming  $n$ -dimensional objects into  $(n + 1)$ -dimensional objects, and Duchamp implicitly transforms three-dimensional chess into four-dimensional chess with the poster for the French chess championship. The direction of any such rotation would be, by necessity, highly ramified—as is perhaps suggested by the random dispersal of the two-dimensional *cases* of the chessboard after they have become three-dimensional *cases* or cubes. Duchamp developed the poster from a photograph of building blocks lumped together in a sack made of netting. The blocks and their arrangement can be interpreted as three-dimensional *cases* projected from four-dimensional space. They are geometrical precursors to the hypercube and are possibly related to an interdimensional *épanouissement*. They are like the marble cubes replicated over and over again in *Why Not Sneeze?*—a work whose title overtly implicates geometrical forms and sexual activity. In Duchamp's etching *King and Queen* (Fig. 8), a late work derived from the chess poster, the randomly dispersed *cases* form a geometrical *épanouissement* between the male and female chess pieces.

Another work associated with Rose Sélavy is *Belle Haleine, Eau de Voilette*, one of Duchamp's most famous uses of Man Ray's photographs. Duchamp redesigned the label from a Rigaud perfume bottle, using a logo "R.S." (for Rose Sélavy) with the "R" written backwards—a rotation that implies mirror reversal. The perfume bottle's other iconographical associations—

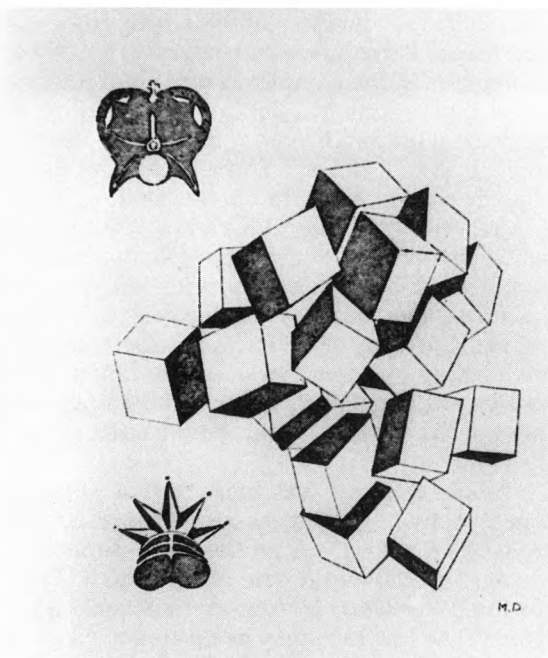


Fig. 8 Marcel Duchamp, *King and Queen*, 1968. Collection Mme Marcel Duchamp, Villiers-sous-Grez.

beautiful Helen, beautiful breath, veil water, toilette water, etc. – suggest various aspects of an *épanouissement*. Moreover, the wafting fragrance of the perfume expands outward, invisibly, as if following the axes of a four-dimensional coordinate system. It recalls both the nature of a flower's scent as an attractant and the pheromonal characteristics of perfumes as used in human mating rituals. These aspects of the work turn the perfume bottle into a matrix of erotic associations, part human and part geometric. Robert Lebel's early characterization of Duchamp's interest in the fourth dimension is correct as far as it goes: the fourth dimension was for Duchamp an "erotic embrace."<sup>22</sup>

In addition to his work with and by Rose Sélavy, Duchamp made several other gestures concerned with changing genders. The best known is his infamous Dada blague *L.H.O.O.Q.* (Fig. 3). By adding a goatee and mustache to a small reproduction of the Mona Lisa, Duchamp transformed Leonardo's smiling lady into a demure gentleman. Duchamp and Leonardo share artistic characteristics and their work is similar, particularly in terms of the scientific cast of their perspective studies and notes.<sup>23</sup> In transforming *La Joconde*, Duchamp was no doubt aware of the Freudian echoes her masculinization would set in motion.<sup>24</sup> He once explained that his "landscapes begin where da Vinci's end."<sup>25</sup> In terms of the geometry, he may have meant by this statement that Leonardo's studies of scientific perspective, some of which are very much like his own, deal only with ordinary landscapes – with the observable three-dimensional world – while his own go beyond this world into the fourth dimension. Perspective projections from the fourth dimension, as Duchamp had seen in the complex diagrams of Jouffret, require numerous rotations and involutions in relation to the coordinates of normal three-dimensional space. One must look at four-dimensional objects again and again from multiple points of view. Some of these projections and rotations turn things inside out. In order to discuss such peculiar geometrical events, Duchamp apparently invented his radically altered alter ego. The sexual transformation involved in his becoming Rose Sélavy can be taken as a metaphorical reference to the convexity-into-concavity transformation involved in taking a *demi-tour* through the *étendue*. And of course, in just these terms, the Mona Lisa's mustache indexes what would happen if Leonardo's "perspective" were rotated through the fourth dimension. The "look" – the perspective – of Duchamp's rectified Mona Lisa suggests the potential consequences of his *n*-dimensional modification of Leonardo's *vetro piano*.

For Duchamp, a "plane of glass" was more than a Renaissance window opening onto the perspective of ordinary space. It was an "infra-thin slice" that contained projections not only from the three-dimensional world but also from the four-dimensional world that lies beyond it. From this point of view, the Bride in the *Large Glass* is "four-dimensional." She is a *retard en verre*, a "delay in glass." The pun here may be on *envers*,<sup>26</sup> as in the expression *à l'enverse*, or "inside out," implying that she is a frozen projection from the fourth dimension, rotated around a stationary plane like the tetrahedron in Jouffret's diagram (Fig. 2). The transparency of the *Large Glass* makes the four-dimensional rotation at least theoretically visible, since we can walk

around the Glass and look through it from the *envers*, the reverse side, an operation that turns its various elements inside out.

The general theme of inside/outside reversal also recalls Duchamp's last major work, now installed in the Philadelphia Museum of Art, *Étant donnés: 1° la chute d'eau, 2° le gaz d'éclairage*. The nude torso seen through the peep-holes in the door can be connected with Rose Sélavy and her bearded anti-type, the Mona Lisa in *L.H.O.O.Q.* The almost overly explicit reworking of the "Bride Stripped Bare" in *Étant donnés* becomes yet another *n*-dimensional reincarnation of Duchamp's androgyne. The male/female qualities of the mannequin-like figure are not explicit, but it is significant that Duchamp made two castings from her – one female and one male.<sup>27</sup> The first of these objects, the *Female Fig Leaf* (Fig. 9), was cast directly from the pudendum of the figure; like the *Fountain*, it suggests a concavity/convexity transformation with geometrical implications that go beyond its shock value. Francis Naumann has pointed out that "although the mold was never used for the casting of a positive form, in 1956 [for the cover of *Le Surréalisme, même*] Duchamp had the work specially photographed so that through the control of light he might create an illusion of seeing the sculpture inside out and upside down."<sup>28</sup>

The second of Duchamp's late erotic objects also involves an inside/outside reversal, but one even more in keeping with his interest in changing sexuality. The *Objet-Dard* (Fig. 10) was made from a piece of broken plaster



Fig. 9 Marcel Duchamp, *Female Fig Leaf*, 1950. Philadelphia Museum of Art.



Fig. 10 Marcel Duchamp, *Objet-Dard*, 1951. Philadelphia Museum of Art.

used as a brace underneath the figure's arm. Given this fortuitous origin, the female/male inversions here take on a kind of scriptural cast. Naumann points out that "according to the biblical account, Eve was created from Adam's rib. Similarly, in the making of the *Objet-Dard*, an emphatically male symbol was created from an internal reinforcement located precisely in the anatomical position of the figure's rib. In other words, just as he freely shifted sexual identities with the creation of Rose Sélavy, Duchamp has here symbolically created 'man' from the rib of a female figure."<sup>29</sup>

The mold/cast, negative/positive reversals and the inside/outside transpositions involved in these late "readymades" are relevant to the discussion of four-dimensional rotation. They invoke the male-to-female changes of Rose Sélavy and the female-to-male changes of the Mona Lisa in *L.H.O.O.Q.* It is worth repeating Duchamp's statement that his own "landscapes begin where da Vinci's end." Both the landscape in *Etant donnés* (a hand-painted photograph of a Swiss hillside) and the rolling hills behind the Mona Lisa show running water. This iconographic detail rotates these images into an interpretive frame embracing a number of Duchamp's other works. It recalls in particular an important precursor to the nude figure in *Etant donnés*: the mannequin in the window display that Duchamp designed for the Gotham Book Mart in New York in 1945 on the occasion of the publication of André Breton's *Arcane 17* (Fig. 11). This showcase also involves running water and, like *L.H.O.O.Q.* and Rose Sélavy, can be taken in terms of a male-female transformation.<sup>30</sup> To the thigh of the mannequin used in the display, Duchamp attached a faucet that functions as an analogue for the "Waterfall" in the *Large Glass* and *Etant donnés*. The window arrangement also shares characteristics with the *tableau-vivant* nature of *Etant donnés*: both are like dioramas. The window design is called "Lazy Hardware," and it suggests the best-known alternate reading of Rose Sélavy: "*arroser la vie*."<sup>31</sup>

The celebratory "drink-it-up" connotations of this expression carry it toward the "watering" nature of maleness. Robert Lebel points out that "if the term [the pun on Rose Sélavy and *arroser la vie*] is always so flexible, it verges, so to speak, toward the masculine by emphasizing this time the servitude of the 'malic' function."<sup>32</sup> The faucet on the mannequin is an obvious phallic symbol and transforms the female figure into a male, much as the addition of a goatee and mustache in *L.H.O.O.Q.* transforms the Mona Lisa, or Man Ray's photographs transform Duchamp. Moreover, the title, "Lazy Hardware," alludes to one of the salacious puns of Rose Sélavy: "Parmi nos articles de quincaillerie paresseuse, nous recommandons le robinet qui s'arrête de couler quand on ne l'écoute pas."

The sexual overtones of this spiraling play of words, which first appeared in Duchamp's film *Anémic/Cinéma*, are largely lost in the English translation: "Among our articles of lazy hardware, we recommend the faucet that stops running when no one is listening to it."<sup>33</sup> One of the best-known photographs of "Lazy Hardware" shows Duchamp and Breton reflected in the glass of the storefront window. They are, of course, mirror-reversed and rotated by the reflection, and that can be taken as a reference to the more abstract rotation of the two-dimensional imagery of the *Large Glass* around the stationary



Fig. 11 Marcel Duchamp and André Breton, Window installation for the publication of Breton's *Arcane 17* at the Gotham Book Mart, New York, 1945. Collection Mme Duchamp, Villiers-sous-Gréz.



plane of an old door into the three-dimensional imagery of *Etant donnés*. The year after he completed the window display, Duchamp designed a cover for Breton's collection of poetry, *Young Cherry Trees Secured Against Hares*.<sup>34</sup> By replacing the face of the Statue of Liberty with that of Breton, Duchamp submits his friend to a male/female transformation. The lamp held aloft by the Statue of Liberty suggests the lamp held aloft by the nude figure in *Etant donnés*. These iconographic details serve to interrelate both "Lazy Hardware" and *Young Cherry Trees Secured Against Hares* with Duchamp's earlier work and his subsequent conceptualization of the last piece.



Fig. 12 Marcel Duchamp, *Mirrorical Return*, 1964. Collection Arturo Schwarz, Milan.

That these various associations do in fact converge in an interpretation consistent with the sexual consequences of a rotation through the fourth dimension here proposed is reinforced by one of Duchamp's last works: a 1964

etching of the urinal (Fig. 12), whose title incidentally implies a mirror reversal since a *Fountain* can be thought of as a drain turned inside out. On this work Duchamp wrote the following: "An Original Revolutionary Faucet: 'Mirrorial Return' 'A faucet that stops dripping when no one is listening to it.'" Thus Duchamp himself associates Rose Sélavy and her puns, his readymade *Fountain*, "revolution," and the geometrical notion of mirror-reversal and "mirrorial return" – and does so at a time when he was working in secret on *Étant donnés*.

Duchamp's subjects are in general sexual and erotic. Many of his most important works deal with nudes that are, in one way or another, geometrical. Reciprocally, the majority of his geometrical readymades have a strange nakedness about them. Duchamp's use of Rose Sélavy as a purveyor of alternate approaches is a related activity. She was his alter ego and also his alter-nator, a kind of desire magneto that allowed him to shock his audience. In many instances, Duchamp treats his subjects and activities ironically. His whimsical view of human behavior allowed him to remain detached, and the erotic undercurrent of his work, its sexual echo, gave it a delicious wickedness that kept him interested. It accounts as well for at least some of our own interest. The surface humor of Duchamp's work would have soon paled were it not for the more profound levels that it masks. The eroticism, like the readymades, is first funny and then ironic and then epistemic. Duchamp's bizarre erotic games are intermeshed with other systems of thought, with mathematics and epistemology, and at those levels they are profound. Without the eroticism, the subsequent impact of his work on late twentieth-century art practice would have been less dramatic and less wide-ranging.

## Notes

1. See Duchamp's statements to Pierre Cabanne, *Dialogues with Marcel Duchamp*, trans. Ron Padgett (New York: Viking, 1971), 88–89.
2. Duchamp was familiar with Jouffret's *Traité élémentaire de géométrie à quatre dimensions et introduction à la géométrie à n dimensions* (Paris: Gauthier-Villars, 1903); and also its sequel, *Mélanges de géométrie à quatre dimensions* (Paris: Gauthier-Villars, 1906). For a more complete discussion of Duchamp's mathematical sources, see Craig Adcock, *Marcel Duchamp's Notes from the Large Glass: An N-Dimensional Analysis* (Ann Arbor, Michigan: UMI Research Press, 1983), 29–39.
3. Jouffret, *Mélanges*, 192.
4. The Wells story was first published in 1897; for a pertinent passage, see *The Short Stories of H. G. Wells* (London: Ernest Benn Ltd., 1927), 328: "Mathematical theorists tell us that the only way in which the right and left sides of a solid body can be changed is by taking that body clean out of space as we know it, – taking it out of ordinary existence, that is, and turning it somewhere outside space. This is a little abstruse, no doubt, but anyone with a slight knowledge of mathematical theory will assure the reader of its truth. To put the thing in technical language, the curious inversion of Plattner's right and left sides is proof that he has moved out of our space into what is called the Fourth Dimension, and that he has returned again to our world."

5. Jouffret, *Traité*, 40–41; see also *Mélanges*, 192 ff.
6. Jouffret, *Traité*, 85–88. In *Mélanges*, Jouffret refers to this passage, reminding us that “dans le *Traité élémentaire* nous avons appliqué le calcul au cas d’une sphère creuse et montré qu’un demi-tour dans l’étendue, ou tout mouvement équivalent, a encore pour effet de la retourner, sa surface intérieure devenant extérieure, et réciproquement” (p. 194).
7. In his interview with Otto Hahn (“Marcel Duchamp,” *L’Express* [Paris], no. 684 [July 23, 1964], 22; quoted in Arturo Schwarz, *The Complete Works of Marcel Duchamp* [New York: Abrams, 1970], 466), Duchamp hints that he intentionally chose the urinal because it was disagreeable: “[choosing the urinal] sprang from the idea of making an experiment concerned with taste: choose the object which has the least chance of being liked. A urinal – very few people think there is anything wonderful about a urinal.”
8. For Duchamp’s use of geometrical conventionalism, see Craig Adcock, “Conventionalism in Henri Poincaré and Marcel Duchamp,” *Art Journal* 44 (Fall 1984), 249–58.
9. Marcel Duchamp, *Salt Seller: The Writings of Marcel Duchamp (Marchand du Sel)*, ed. Michel Sanouillet and Elmer Peterson (New York: Oxford University Press, 1973), 23.
10. Recall Duchamp’s often-quoted remark that “for me there is something else that is different from *yes*, *no*, or from *indifferent* – for example, *absence of investigation in this area*.” Quoted in Octavio Paz, *Marcel Duchamp, Appearance Stripped Bare*, trans. Rachel Phillips and Donald Gardner (New York: Viking, 1978), 70.
11. Marcel Duchamp, *Notes*, trans. Paul Matisse (Boston: G. K. Hall, 1983), No. 189.
12. For a discussion of Duchamp’s use of “infra-thin” and its geometrical implications, see Adcock, *Marcel Duchamp’s Notes*, 48–55.
13. For a discussion of the four-dimensional aspects of this film, including the mirror-reversed title frame, see Adcock, *Marcel Duchamp’s Notes*, 170–86.
14. Dalia Judovitz, in “Anemic Vision in Duchamp: Cinema as Readymade,” *Dada/Surrealism* 15 (1986), 51, has suggested that the title frame for the film, particularly the way the words meet, seems to imply a reversed perspective with the vanishing point occurring in the viewer rather than in the image. In the rotational photograph of Duchamp, the involuted perspectives and the geometrical reverberations suggest the complex nature of the fourth dimension. The linear perspective reversals of the *Anémic Cinéma* frame also seem to be concerned with turning things inside out along four-dimensional lines.
15. See Duchamp, *Salt Seller*, 77; Duchamp, *Notes*, Nos. 185 and 186.
16. See Adcock, *Marcel Duchamp’s Notes*, 19–27.
17. See Duchamp’s statement quoted by Katherine Kuh in “Marcel Duchamp,” *20th-Century Art from the Louise and Walter Arensberg Collection*, exhibition catalogue (Chicago: The Art Institute of Chicago, 1949), 17.
18. For a discussion of the mathematical implications of the term, see Adcock, *Marcel Duchamp’s Notes*, 153 ff; see also Matisse in his “Translator’s Note” to Duchamp’s *Notes*, n.p.
19. Jouffret, *Traité*, 62–63.
20. Paz, *Marcel Duchamp, Appearance Stripped Bare*, 50.

21. For a discussion of their use of the term, see Adcock, *Marcel Duchamp's Notes*, 61–63.
22. This is Octavio Paz's rendition of Lebel's statement (Paz, 42). See Lebel, *Marcel Duchamp*, trans. George Heard Hamilton (New York: Grove Press, 1959), 27–28: "As usual [Duchamp] started with a very simple observation: A three-dimensional object casts a shadow in only two dimensions. From that he concluded that a three-dimensional object must in its turn be the shadow of another object in four dimensions. Along these lines he created the image of the *Bride* as the *lunar* projection of an invisible form. Yet this transcendental conception was reinforced by his very tactile idea of the fourth dimension, since he considers the sexual act the pre-eminent fourth-dimensional situation."
23. For discussions of the relationships between Duchamp and Leonardo, see Theodore Reff, "Duchamp & Leonardo: L.H.O.O.Q.-Alikes," *Art in America* 65 (January–February 1977), 82–93; Jean Clair, "Duchamp, Léonard, La Tradition maniériste," in *Marcel Duchamp: tradition de la rupture ou rupture de la tradition?*, Colloque du Centre Culturel International de Cerisy-la-Salle, ed. Jean Clair (Paris: Union Générale d'Éditions, 1979), 117–44.
24. See Duchamp's remarks in his interview with Herbert Crehan, "Dada," *Evidence* (Toronto), no. 3 (Fall 1961), 36–38.
25. Interview with Francis Roberts, "I Propose to Strain the Laws of Physics," *Art News* 67 (December 1968), 63.
26. The possibility of Duchamp's punning between "*en verre*" and "*envers*" was suggested to me by Charles Stuckey in conversation, April 1987.
27. For a mathematical discussion of these objects from a topological point of view, see Jean Clair, "Sexe et Topologie," *Abécédaire*, exhibition catalogue (Paris: Centre Georges Pompidou, 1977), 52–59.
28. Francis M. Naumann, *The Mary and William Sisler Collection* (New York: The Museum of Modern Art, 1984), 214.
29. *Ibid.*, 216.
30. For a discussion of this window, see Charles F. Stuckey, "Duchamp's Acephalic Symbolism," *Art in America* 65 (January–February 1977), 94–99.
31. Duchamp used the pun in this way in conjunction with his signature on Francis Picabia's painting *The Cacodylatic Eye* in 1921.
32. Lebel, *Marcel Duchamp*, 46.
33. Duchamp, *Salt Seller*, 106. For a discussion of Duchamp's puns, see Katrina Martin, "Marcel Duchamp's *Anémic-Cinéma*," *Studio International* 189 (January–February 1975), 60. For an analysis of the sexual implications of the film, see also Annette Michelson, "'Anemic Cinema,' Reflections on an Emblematic Work," *Artforum* 12 (October 1973), 64–69.
34. The relationships between "Lazy Hardware" and the cover for *Young Cherry Trees Secured Against Hares* are discussed by Stuckey, 98.